Faculty of Economic, Social and Political Sciences

ECON3503   Advanced Econometrics

[45h] 7 credits

Teacher(s):   Luc Bauwens
Language: English
Level: Third cycle

Aims

The purpose of the course is to cover several important topics in econometric theory, at an intermediate or advanced level without assuming necessarily a previous knowledge in econometrics (although knowledge of introductory econometrics is recommended) ; the principle is to move quickly from a basic level to an advanced one

Main themes

It is impossible to cover all the important topics of econometrics in this way in 30 hours. However, some topics should be covered every year, such as :- generalized least squares theory, thereby encompassing classical least squares and enabling to cover the treatment of serial correlation, heteroskedasticity, systems of equations, error component models, random coefficients models ...);- standard large sample theory (with application to maximum likelihood estimation, nonlinear least squares, robust estimation ...). Apart from this, topics could be selected in the following menu :- simultaneous equation models (linear or not)- qualitative response models (discrete choice analysis)- Tobit models (limited dependent variables)- models for count data (discrete dependent variables)- non-standard large sample theory (with application to time series models with unit roots ...)- Markov chain and duration models- semi-parametric and non-parametric techniques.

Content and teaching methods

Contents
Notions in multivariate statistics (joint, conditional and marginal distributions and moments; law of iterated expectation; transformation of random vectors; multivariate normal distribution and quadratic forms). Basic tools of asymptotic distribution theory (including the fundamental concepts and models of time-series analysis). Regression analysis and the theory of least squares (finite sample and large sample theories). The basics of maximum likelihood estimation, of the generalized method of moments, and of hypothesis testing. Issues related to heteroskedasticity, autocorrelation, identification, endogeneity, and instrumental variables are covered.
Method
The principle is to reach quickly an advanced level, especially for the topics that are covered in undergraduate courses. Each course consists of weekly lectures and discussions based on assigned readings in the textbook. Students must work regularly to follow the courses. This involves readings and solving assigned exercises, and computer programming They must complement theory learning by doing the empirical applications, using ap-propriate econometric software, of the reference textbook.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Mathematics, statistics and econometrics at the level of an undergraduate program in economics. Notions of computer programming.
Written or oral exam, closed book.
Hayashi, F. (2000). Econometrics. Princeton University Press.
A doctoral student will be the teaching assistant.

Programmes in which this activity is taught

AGRO3DA	Diplôme d'études approfondies en sciences agronomiques et ingénierie biologique
ECGE3DA/EC	Diplôme d'études approfondies en économie et gestion - Master of Arts in Economics (sciences économiques)
STAT3DA	Diplôme d'études approfondies en statistique

Other credits in programs

ECGE3DA/EC	Diplôme d'études approfondies en économie et gestion - Master of Arts in Economics (sciences économiques)	(7 credits)	Mandatory
STAT3DA	Diplôme d'études approfondies en statistique		
STAT3DA/E	diplôme d'études approfondies en statistique (statistique et économétrie)	(7.5 credits)	Mandatory
STAT3DA/M	Diplôme d'études approfondies en statistique (méthodologie de la statistique)	(7.5 credits)	
STAT3DA/P	diplôme d'études approfondies en statistique (pratique de la statistique)	(7.5 credits)	